



The Spindle

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Efficiency analysis in higher education capacity building projects

Developing countries invest in higher education to develop their own capacity to acquire and generate knowledge in support of their economic and social development, and to pass on this knowledge to next generations. Donor organisations and programmes such as Nuffic, DAAD, Erasmus+ to support international collaboration between higher education institutions with the aim to strengthen the capacity of universities in low and lower-middle income countries. This case explains how to analyse efficiency in projects aimed at capacity development in higher education.

The Partos Efficiency Lab, November 2017

This case is one of a series of ten that was produced in the framework of the Partos Efficiency Lab. See back cover for more information.

Project at-a-glance

- Project type: Developing capacity in higher education
- Geographic intervention area: Region in a West African Country
- Project budget: EUR 1,9 million
- Project Duration: 4 years:

Project objective

The project objective to strengthen the capacity of University of A. in providing a high quality and relevant education with regard to three MSc programmes in sectors that feature as priorities in the National Development plan:

- Agriculture (30 graduates/year)
- Natural resource management (20 graduates/year)
- Water and sanitation (25 graduates/year)

The core problem this project will address is that the University of A. is currently not able to deliver graduates that are equipped with the competencies employers are looking for in these sectors. In order to improve the performance of the University of A. the project is expected to address capacity constraints in five areas:

- Curricula are outdated, not geared to labour market requirements and not gender sensitised
- Teaching methods are traditional, lecture-based and do not inspire students to become active learners.
- Faculty lacks the educational and academic qualifications for teaching. Most staff have a MSc degree whereas a PhD is required to teach master students.
- The quality assurance system is inadequate. Although a quality assurance policy has been adopted staff is struggling with the implementation
- Limited physical facilities (library, laboratory and ICT facilities)

Project approach

The project will start with stakeholder consultations in the three sectors to identify:

- The competencies (knowledge, attitudes and skills) employers expect from graduates who enter the labour market; and
- Priority areas for knowledge development through research.

The stakeholder consultations will inform five core capacity development components which include:

Curriculum review/revision

The curricula of the three MCs programmes will be reviewed and revised. The curriculum reviews will not only focus on labour market needs but also on preparing graduates to contribute to gender equality in their future profession

Teaching

The project will support the transition to a more student centered teaching approach through which students will, in addition to knowledge, acquire the attitudes and skills-sets expected in the sector.

Faculty development

- 7 staff with a master degree will pursue a PhD (4 in the Netherlands and 3 in Africa)

- 8 staff with a bachelor-degree will pursue a MSc degree (4 in the Netherlands and 4 in Africa)
- PhD and MSs theses will on knowledge questions within priority areas identified in the consultations with the stakeholders

Quality assurance

Quality assurance methods and tools will be developed, and staff will be trained in applying these in accordance with the institutional quality assurance framework

Investments

Investments amounting to EUR 190.000 will be made in library, laboratory and ICT facilities which are critical for the three master programmes.

Project organisation

The project is implemented by a consortium of organisations led by an NGO. The NGO is responsible for coordination and the financial management of the project. The other consortium partners include:

- A consultancy firm with expertise in facilitating curriculum reviews and developing quality assurance systems for education.
- Two Dutch Universities with academic expertise in agriculture, natural resource management and water & sanitation.

The project management is composed of a project manager employed by the NGO and a project coordinator of the University of A. The project manager is supported by a secretary and a financial administrator. All expertise will be hired from the consortium partners.

Recommended approaches for assessing efficiency

Notes on applicable tools and methods, Markus Palenberg

This note summarizes tools and methods that can be applied to assess efficiency in the higher education capacity development project (case #3). It reflects my personal assessment and views. After brief remarks on the case (Section 1), I discuss applicable tools and methods first for level 2 (Section 2), and then for level 1 (Section 3).

1. Remarks on the case

The ToC has a slow-moving component (faculty development) that will deliver full results only after the 4-year project is over:

- In full-time, MSc will take 2 years and PhD 3-5, both considerably longer if done in part-time if that staff continues to work in the university while receiving the extra education.
- After staff has returned and start teaching, the first MSc graduates will emerge after another 2 years.

No evaluation budget or timing is provided.

2. Level 2 tools and methods

Level 2 tools and methods compare the efficiency of entire aid interventions with alternatives or benchmarks with the purpose of selecting those interventions producing the largest total net benefit with available resources.

Conducted ex-ante, level 2 tools and methods are of interest for:

- Program officers of development organizations who are in charge of project identification and design;
- Funders who need to select projects to which resources will be allocated; and
- Evaluators tasked to evaluate efficiency.

The methods in this group can also be conducted ex-post for accountability and learning purposes, i.e. to verify or correct ex-ante estimates, to improve assumptions for subsequent ex-ante application, and to help project managers improve on operational performance.

Cost-Effectiveness Analysis (CEA)

A Cost-Effectiveness Analysis (CEA) can be conducted that estimates (ex-ante) or measures (ex-post) education-related cost-effectiveness indicators for the project. Those provide benchmarks that can be compared to other higher education programs and to existing MSc courses of other universities in the three sectors.

CEA (and other efficiency analyses as well) need to be adjusted to the long time-scales of higher education:

- Project components 1-2 (curricula and teaching methods) and 4-5 (QA and facilities) are likely to become effective during the project lifetime. Faculty staff receiving MSc or PhD degrees as part of the project (component 3: faculty education) appear central for success

as they are supposed to teach the 3 new MSc courses but will be effective only towards the end or after the 4-year project period. For first project outcomes (75 MSc students graduating per year), another 2 years must be added.

- Impacts in terms of job and sector performance through higher education usually materialize some or many years after graduation.

Because of these timing issues, both ex-ante and ex-post CEAs should be conducted with results several years after project end in mind. For ex-ante CEA, sensitivity analysis would be important to obtain a sense of dependence of the cost-effectiveness on assumptions made.

An operation-level indicator could be the cost per enrolled student. To include outcomes and approximate impacts, indicators such as the cost per graduating student, the cost per graduating student above a certain threshold grade, or the cost per percentage point grade increase could be used. When doing this, care must be taken to differentiate one-time investments from ongoing operational costs.

When using cost-effectiveness ratios that involve scales, care must be taken when interpreting results. For example, benefits associated with graduation are unlikely to be proportional to grades (or grade increases), i.e. paying 10% more for 10% higher grades does usually not imply 10% more benefits. This means that only special cases can be strictly ranked¹.

If post-university employment information is available, for example from a tracer study or alumni databases, the cost per student finding employment because of the program (with and, separately, without graduation) can be determined.

A typical issue to be considered is students using their increased qualifications to find work abroad, and hence not contributing to the projects intended impact of contributing to increased national plan sector performance. In a similar vein, project efficiency may be reduced by university staff not returning after receiving additional education abroad as part of component 3 of the project. While not contributing to the project's intended results, these "dropouts" remain positive outcomes from a human development point of view.

CEA results can also be disaggregated along segments in terms of gender, type of MSc course, and student cohorts (as explained in more detail in the next section).

CEA, as outlined above, is limited in that it doesn't have much explanatory value on how (or why not) outcomes were achieved, something that can be addressed if CEA is complemented by theory-based evaluation approaches and partial efficiency analysis (see next section). One issue of interest could for example be the strategic choice of developing existing university staff vis-à-vis the option of hiring of qualified (national) academicians. Ex-ante or ex-post CEAs can be conducted for both cases for learning and future decision-making on similar programs.

CEA as described above can usually be conducted in a matter of several days to several weeks and only requires basic economic and financial analysis skills. As mentioned, ex-post CEA would need to "wait" for data until several years after project end to be able to assess outcomes.

Cost-Benefit Analysis

Cost-Benefit Analysis (CBA) can also be applied. It could estimate the net benefits, for example in terms of additional expected earnings related to the new MSc courses, compared to a suitable

¹ For example, for the same cost, increasing grades from 70% to 80% is preferable to increasing from 70% to 75% (criterion of dominance), but for the same cost, increasing grades from 70% to 80% cannot be ranked with respect to increasing from 75% to 90%, at least not without additional information.

counterfactual scenario where, for example, prospective students would enter the labor market without additional qualification.

CBA for the present case could be useful for demonstrating high social return on invest for the education program which could be an important enabling argument for replication in other universities and for prospective donors.

Conducting a CBA usually takes several to many weeks and requires advanced economic analysis skills.

Multiple-Attribute Decision-Making (MADM)

Scoring models, a pragmatic method for Multiple-Attribute Decision-Making (MADM) can usefully be applied to the present case at two points in time: before program start to facilitate important design decisions, and after the program to synthesize strategic lessons learned.

MADM methods and tools facilitate decision-making in the face of incomplete data and uncertainty. As such, they complement rather than replace other methods, i.e. they could, for example, build on results of level 1 efficiency analysis (see next section) or any other evaluative information.

A MADM scoring model calculates total scores for different intervention alternatives based on a set of weighted criteria. Scoring models are best used iteratively, i.e. by inviting the adjustment of previously established criteria and weights after initial scoring until the model best reflects available information and data, and the professional opinions, experiences and preferences of those conducting the exercise. The main advantage of this approach is that the decision-making process is transparent to the decision-maker and to stakeholders. It is also systematic in the sense that criteria, weights and scores can be critiqued separately, leading to more informed decisions. However, the transparency of this approach can become caveat if decisions are significantly driven by arguments decision-makers decline to share; something to ascertain before deciding to implement it.

In the present case, criteria could be, for example, strategic choices such as hiring in versus qualifying existing staff or incentives for retaining academic staff at university, and graduated students in the country, including expected or measured costs and benefits for different approaches. The final set of criteria, weights and the actual scores should be developed in a participatory process, for example by a group of education experts with local experience. Scoring models usually require several days of analysis time and basic analytical and stakeholder interaction skills.

3. Applicable level 1 tools and methods

Level 1 tools and methods identify efficiency improvement potential in one project. While level 2 methods compare the outcome/impact efficiency of different interventions, level 1 analysis focuses on the operational efficiency of a single intervention.

Level 1 tools and methods are often conducted ex-post. They are of interest to:

- Project managers responsible for project planning and implementation;
- Funders and program officers of development organizations who want to ensure that funded projects operate with maximal efficiency; and
- Evaluators tasked to evaluate efficiency.

Methods in this group can also be applied ex-ante (or during implementation) to inform project design and to adjust project approaches and implementation plans.

Several level 1 tools and methods are useful for evaluating the project at hand.

Cost-Effectiveness Analysis (CEA)

The CEA approaches discussed in the previous section can also be applied project-internally, for example by benchmarking the three MsC courses against each other, or by comparing student cohorts with different graduation years. A flexible alternative to CEA based on "hard" enrolment and grade data is to survey students and base CEA on the cost for achieving improvements in surveyed dimensions. While based on subjective data, this approach would allow to test for softer (but not necessarily less important) effects such as increased self-confidence, awareness of gender issues, perceived learning and improved future economic outlook.

Benchmarking of unit costs and other partial efficiency indicators

Similarly, unit costs benchmarking can be applied in several ways for this project. Project-related procurement (component 5) can be benchmarked with similar projects. Other unit costs could be time and investment into curricula development or the cost for MsC and PhD education of university staff (component 3).

A principal caveat with unit costs benchmarking is that it does not allow straightforward conclusions about outcome/impact-level effectiveness and efficiency. For example, higher cost for education may indicate overspending but can also be entirely justified by better quality of education. Therefore, unit cost benchmarking is a useful tool for identifying potential operational (in)efficiencies but needs to be complemented by further analysis before conclusions can be drawn. In contrast, unit cost benchmarking works well if prices for identical goods are compared, as for example in the case of component 5. Similar caveats hold for all level 1 tools and methods as they all focus on partial efficiency (rather than outcome/impact level efficiency).

Apart from unit cost, other partial efficiency indicators can be useful as well when tracking key assumptions made in the project, especially if there is an underlying theory of change connecting project activities and context factors with intended outcomes and impacts. For example, the student dropout rate (and the non-return rate of component 3 staff) would be important measures that can be compared with other projects or general higher education benchmarks.

Unit costs and partial efficiency indicators can also be compared across different projects, but care must be taken that they allow for meaningful benchmarking. On a technical level, this requires that they are calculated with the same protocol. On a qualitative level, it means that they are applied to similar projects under similar conditions.

Benchmarking of unit costs and other partial efficiency indicators can usually be done in a matter of days (provided required information is available) and does only require basic analytical and quantitative skills.

"Follow the Money" approach

A simple and straightforward approach with high potential for identifying cost saving potential in the project at hand is the "Follow the Money" approach. When applying it, the evaluator systematically disaggregates total project expenditures and, for each budget or expense category, conducts additional analysis to determine whether there is cost-saving (or yield increase) potential. In the present case this could e.g. include the above-mentioned partial CEA and unit cost benchmarking but also expenditures for administration, management and M&E.

One strength of this approach is that it systematically screens all project expenses. A weakness is, as with all level 1 methods, that it is often difficult to judge outcome/impact-level consequences associated with lower cost options.

Applying the Follow the Money approach requires one to several weeks. Evaluators require basic analytical, financial, and problem-solving skills.

Comparative ratings by stakeholders

A participatory method that can be useful in the present case is to ask or systematically survey stakeholders, for example the students themselves, their parents and their teachers, and (later) their employers for their opinions on perceived effectiveness and efficiency, for example of different didactic models, curricula, schedules and physical setup. Questions can directly aim at partial efficiency or, if cost considerations are difficult to assess for respondents, at effectiveness (which the evaluator then complements with information on costs during analysis).

Comparative ratings usually require time for conducting survey with a sample or all targeted stakeholders. In addition, only little time (e.g. several days) is required for conducting the analysis. Evaluators need basic analytical and survey skills.

